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S&S TÜV Long Block Owner's Manual

Congratulations on purchasing an S&S engine! Your new engine is designed and manufactured with the same care and attention to detail as those used to set speed records and win races around the world. This engine conforms to all applicable regulations effective on the date of manufacture.

This manual has been prepared to acquaint you with the operation, care, and maintenance of your engine, to notify you of important safety information, and to provide authorized service personnel with necessary emissions control specifications. Other S&S publications discuss repairs and/or changes to the engine configuration. The motorcycle manufacturer's manuals should be consulted for information related to other parts of the motorcycle.

OWNER INFORMATION	**ENGINE AND VEHICLE INFORMATION**
Name: _____	Engine Identification No.: _____
Street: _____	Displacement: _____
City: _____	TÜV Certification No. - EMC: _____ 350-576-99-FBTK_____
State: _____ Zip Code: _____	TÜV Certification No. - Engine Description: _____
Telephone: _____	TÜV Certification No. - Exhaust: _____
Notes _____	TÜV Certification No. - Sound: _____
_____	Ignition System: _____
_____	Vehicle Identification No.: _____

Sample

IMPORTANT NOTICE

Statements in this Owner's Manual preceded by the following words are of special significance.

WARNING
Means there is the possibility of injury to yourself or others.

CAUTION
Means there is the possibility of damage to the engine or motorcycle.

NOTE
Other information of particular importance has been placed in italic type.

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ENGINE IDENTIFICATION NUMBER

The Engine Identification Number (EIN) is stamped on the left side of the crankcase below the front cylinder deck, and on the right side immediately forward of the front tappet guide. It consists of a seven-character code (see example below). The first and last characters are stars (*). The second character is a letter that designates the code for the model year of the engine. The four characters that follow are the crankcase serial/sequence number for that year.

W1234

***** - Leading Star
W - Year Code

1996	W
1997	X
1998	Y
1999	Z
2000	A
2001	B

1234 - Crankcase Sequence Number for that Year.
*** -** Trailing Star

CONTROLS AND GAUGES

The starter, key switch, engine-stop switch, throttle control grip, tachometer (if available), speedometer, oil pressure gauge, voltmeter, and fuel gauge are discussed in detail in the motorcycle owner's manual.

ENRICHMENT DEVICE
The carburetor uses a mixture enrichment device instead of a choke, but it is operated in a similar manner. During starting and operation before the engine is warmed up, the lever located on the upper side of the air cleaner is pulled up. When the engine is sufficiently warm, as described in the OPERATION section, the enrichment device lever is pushed down.

PETCOCK
The petcock is located under the fuel tank as described in the motorcycle owner's manual. On some motorcycles, the petcock operates automatically. On others, manual operation is required.

WARNING/CAUTION - Motorcycles with manual-operated petcock: petcock should always be closed when engine is not running to prevent accidental overflow of gasoline and possible fire hazard or damage to engine.

Further information about the petcock may be found in the motorcycle owner's manual.

OPERATION

ENGINE SPEED AND LOAD
CAUTION - Do not run engine above 2,500 RPM with clutch disengaged or transmission in neutral. Exceeding 6,500 RPM under any circumstances may damage the engine.

An engine run long distances at high speed or under heavy load may overheat. Oil and spark plugs should be inspected more frequently when the engine is subjected to extreme temperatures.

IDLE SPEED
CAUTION - Do not idle engine more than five minutes with motorcycle standing still. Overheating may result.

Normal warm idle speed is 900 RPM. When the enrichment device lever is pulled up with a cold engine, the idle will be higher.

OIL PRESSURE
Engine oil pressure varies from 5 psi (.34 bar) at idle to 12-15 psi (.83-1bar) at 50 mph (80 kph) when the engine is at normal operating temperature.

ALTITUDE
The factory engine calibration was performed at an altitude of 800 feet (250 meters) (Viola, Wisconsin USA). The engine should operate correctly between sea level and 2,000 feet (600 meters) without further adjustment.

BREAK-IN
During the first 500 miles (800 kilometers) of operation, critical parts are "breaking-in" against each other. For this reason:

1. Avoid excessive heat build-up. Do not allow engine to idle for long periods of time.
2. Keep the outside of the engine clean.
3. Do not subject engine to unusual stress or load as with sidecar or trailer.
4. Avoid hard acceleration until the engine is warmed up. Do not lug the engine. Vary the engine speed; avoid maintaining a steady speed for long distances.
5. First 50 Miles (80 Kilometers) - Without lugging the motor, do not exceed 50 mph (80 kph). Keep the engine speed below 2,500 RPM. Change the oil and filter at 50 miles (80 kiliometers).
6. Up to 500 Miles (800 Kilometers) - Do not exceed 65 mph (105 kph). Keep the engine speed below 3,000 RPM. Change the oil and filter at 500 miles (800 kilometers).
7. Up to 2,500 Miles (4000 Kilometers) - Keep the engine speed below 3,500 RPM.

Road Speed At 2,000 & 3,000 RPM In Each Gear Based On Stock Late-Model Harley-Davidson FL and FX Overall Gear Ratios and Rear Tire Size		
Gear	**Road Speed at 2,000 RPM**	**Road Speed at 3,000 RPM**
1st	15 mph (24 kph)	22 mph (35 kph)
2nd	22 mph (35 kph)	32 mph (52 kph)
3rd	30 mph (48 kph)	44 mph (71 kph)
4th	39 mph (63 kph)	58 mph (93 kph)
5th	47 mph (75 kph)	71 mph (114 kph)

For motorcycles not equipped with tachometers, the following table may be used as a guide for estimating the engine RPM in each gear based on the road speed.

PRE-RIDING CHECKLIST

Before riding or with each tank of gas, confirm that your motorcycle is in good operating condition. The motorcycle owner's manual has specific information regarding this subject.

To insure safe, reliable engine operation:

1. Check oil level in oil tank.
2. Check for oil and fuel leaks.

STARTING AND WARM-UP

General:

1. Before starting engine, shift transmission into neutral.
2. Never allow engine to exceed 2,500 RPM immediately after cold start. Engine should run slowly for 15 to 30 seconds. This allows engine to warm up, and oil to reach all surfaces requiring lubrication.
3. Idling with enrichment device lever in full-out position for longer than 30 seconds is not recommended. Lever may be set in intermediate position if engine will not run smoothly with it all the way in.
4. Use oil of viscosity recommended for expected ambient temperature range and type of operation.

Cool Engine:

1. Open petcock if it is manual type.
2. Pull enrichment device lever to raised position.
3. Twist throttle one or two times.
4. Close throttle.
5. Turn Key to IGNITION.
6. Turn Engine-Stop Switch to RUN.
7. Press Start Switch.
8. After engine starts, adjust enrichment lever depending on ambient temperature:
   a. Below 70°F (21°C) - Push enrichment lever in as engine warms. If idle becomes slow or rough, pull lever up slightly. Enrichment lever should be pushed in completely after not more than 60 seconds of operation.
   b. 70°F (21°C) or Warmer - Push enrichment lever completely in after 10 to 30 seconds of operation.

Warm or Hot Engine:

1. Open petcock if it is manual type.
2. Pull enrichment lever to fully raised position.
3. Turn Key to IGNITION.
4. Turn Engine-Stop Switch to RUN.
5. Press Start Switch.
6. After engine starts, immediately push enrichment lever all the way in.

JUMP STARTING

Jump start the motorcycle according to the motorcycle owner's manual.

CAUTION - To avoid damage to ignition system, start engine using a 12 volt booster battery only. Confirm that jumper cables are connected correctly before attempting to start engine.

WARNING - Many motorcycle frames do not allow easy access to battery terminals without touching jumper cables to conductive surfaces which may cause sparks. Batteries often emit explosive gas which sparks may ignite. For this reason battery should be removed from motorcycle for recharging.

GEAR CHANGE SPEEDS

For normal riding, the recommended acceleration shift points to higher gears while accelerating are shown on the following page. Note, for best fuel economy, use the smaller numbers in each speed range.

For normal riding, the recommended shifting procedure to lower gears while decelerating is:

1. Disengage clutch.
2. As motorcycle slows, shift into appropriate gear for beginning next mode of operation.

Recommended Acceleration Shift Points		
Gear Change	**Engine RPM**	**Approximate Road Speed [1]**
1st to 2nd	1800 to 2400	13 to 17 mph (21 to 27 kph)
2nd to 3rd	2000 to 2300	20 to 24 mph (32 to 39 kph)
3rd to 4th	1900 to 2300	28 to 34 mph (45 to 55 kph)
4th to 5th	2100 to 2300	39 to 43 mph (63 to 89 kph)
[1] Based on late model Harley-Davidson FL and FX overall gear ratios and rear tire size.		

3. When slowing to a stop, the clutch should be disengaged when:
   a. The motorcycle speed drops below approximately 15 mph (24 kph).
   b. Engine roughness is evident.
   c. When the engine is lugging.

The motorcycle should be shifted into neutral if it is going to be shut off or kept at an idle for more than a few seconds.

MAINTENANCE

To keep your new engine warranty in force, and to assure proper emissions system operation, regular inspections and servicing must be performed.

PERIODIC
The motorcycle should be checked frequently (for example, with each tank of gasoline) for fuel or oil leaks and oil level. After the engine is warm, the idle speed may occasionally require minor adjustment. The air cleaner should be inspected every few hundred miles. See the motorcycle owner's manual for other recommended periodic maintenance.

BREAK-IN
At 50 Miles (80 Kilometers):
1. S&S recommends an engine oil and filter change.
2. Inspect for fuel and oil leaks.
3. Inspect air cleaner element and service as required.
4. Check tightness of exterior fasteners, except head bolts.

Maintenance at 500 Miles (800 Kilometers):
1. Change engine oil and filter.
2. Inspect for fuel and oil leaks.
3. Inspect air cleaner element and service as required.
4. Check tightness of exterior fasteners, except head bolts.
5. Check operation of enrichment device and throttle controls.
6. Check engine idle speed.
7. Check tightness of engine mounts.

REGULAR SERVICE INTERVALS
Regular lubrication and maintenance will help keep your new S&S engine operating at peak performance. The following table presents a recommended service schedule for average operating conditions. Please refer to the Harley-Davidson Owner's Manual for the required regular maintenance intervals.

CAUTION - Motorcycles operated under adverse conditions (severe cold, heat, dusty or wet conditions, extended idling, pro-longed high speed or extreme load), perform the regular maintenance more frequently to ensure safe, reliable operation.

Recommended Engine Oils	
Ambient Temperature Range	**Viscosity Grade**
Below 40°F (4°C) (Winter Only)	SAE 10W40
40°F (4°C) to 100°F (38°C)	SAE 15W50 or 20W50
50°F (10°C) to Above 100°F (38°C)	SAE 25W60
60°F (16°C) to 100°F (38°C)	SAE 50
80°F (27°C) to Above 100°F (38°C)	SAE 60

Notes:
- Use only API SG or SH rated oil.
- S&S recommends regular oil changes every 1,000 miles (1600 kilometers) when using petroleum-based oil not specifically formulated for motorcycles.

S&S Recommended Regular Service Intervals

Item	Interval
Engine Oil & Filter	Change at 50, 500, 2,500 miles (80, 800, 4,000 kilometers), every 2,500 miles (4,000 kilometers) thereafter.[1]
Air Cleaner Element	Inspect at 50 and 500 miles (80 and 800 kilometers), every 2,500 miles (4,000 kilometers) thereafter.[2] Replace every 5,000 miles (8,000 kilometers). [2]
Tappet Oil Screen	Inspect every 2,500 miles (4,000 kilometers).
Petcock, Lines, & Fittings, Vacuum Lines	Inspect at 50 and 500 miles (80 and 800 kilometers), every 2,500 miles (4,000 kilometers) thereafter.
Fuel Tank Filter Screen & In-Line Fuel Filter (If used)	Every 5,000 miles (8,000 kilometers).
Engine Idle Speed	Adjust as required.
Operation of Throttle & Enrichment Device Controls	Inspect at 500 miles (800 kilometers) and every 2,500 miles (4,000 kilometers) thereafter.
Spark Plugs	Inspect every 5,000 miles (8,000 kilometers). Replace every 10,000 miles (16,000 kilometers) or as needed.
Ignition Timing	Inspect every 5,000 miles (8,000 kilometers).
Engine Mounts	Inspect every 500 miles (800 kilometers) and every 5,000 miles (8,000 kilometers) thereafter.
External Fasteners Except Engine Head Bolts	Re-torque at 500 miles (800 kilometers) and every 5,000 miles (8,000 kilometers) thereafter.

[1] S&S recommends that petroleum-based oil not specifically formulated for motorcycles should be changed every 1,000 miles (1,600 kilometers) after the break-in period.

[2] Replace more frequently if required or if engine is operated in a dusty environment.

ENGINE OIL

Engine oil is a major factor in the performance and service life of the engine. Use the proper grade of oil for the ambient temperature range anticipated before the next oil change as shown in the following table.

Notes: Use only API SG or SH rated oil. S&S recommends regular oil changes every 1,000 miles (1,600 kilometers) when using petroleum-based oil not specifically formulated for motorcycles.

CHECKING, ADDING & CHANGING ENGINE OIL

See the motorcycle owner's manual for information on how to check, add, and change the oil and filter.

HYDRAULIC LIFTER OIL FILTER SCREEN

The access screw for this screen is located on the right side of the crankcase beside the rear tappet block. Carefully remove the screw to expose the spring and filter screen located underneath. Remove the spring and filter screen from the crankcase. Clean or replace the screen. Reinstall the screen (open end down), spring, and screw.

GAS TANK FUEL STRAINER AND IN-LINE FILTER

Inspect and clean the gas tank fuel strainer according to the motorcycle owner's manual. If an in-line filter is used (recommended) , it should be replaced or cleaned according to manufacturer's specifications.

CARBURETOR

The carburetor has been specifically set up for emissions control. All jets are fixed at the factory.

Idle Speed Adjustment

1. Operate motorcycle until engine is warmed up (typically 15 minutes).
2. The idle speed adjustment screw is located on top of the carburetor just under the throttle cable guide. Use a long, blade-type screwdriver to adjust the idle speed to 900 RPM.

AIR CLEANER ELEMENT

The special carbon air cleaner element supplied with TÜV Long Blocks was designed for superior flow and efficiency. The element reduces intake noise emissions, as well as prevents fuel vapors from entering the atmosphere while the engine is shut off. The element should be replaced every 5,000 miles (8,000 kilometers). It is designed to be run dry; i.e., without oil. *Note - oiling filter will cause improper engine operation.* If the poly-carbon element is torn, punctured or has excessive oil build-up, replace the element.

Caution- A damaged, torn, or crushed element may release carbon into the engine resulting in severe engine damage. In the event of a damaged air cleaner element - replace element immediately.

1. Remove air cleaner cover.
2. Remove element.
3. Reinstall new carbon element on air cleaner back plate.
4. Reinstall air cleaner cover.

HYDRAULIC LIFTERS

Hydraulic lifters are self-adjusting. They automatically adjust length to compensate for engine expansion and valve train wear, keeping the valve train free of lash while the engine is running. When starting the engine, the valve train may be noisy until the lifters refill with oil. If the valve train remains noisy after twenty minutes of operation, this may be an indication that one or more of the lifters is not functioning properly. Then, if necessary, remove and clean the hydraulic lifter oil filter screen. Consult an S&S service agent if further service is required.

SPARK PLUGS

Spark Plug Removal:

1. Disconnect spark plug wires from spark plugs by pulling on the molded connector boots. It may help to twist or rock the boots back and forth slightly while pulling.
2. Unscrew spark plugs.

Spark Plug Inspection:

If either of the following conditions occurs, further service is required.

1. A spark plug with a black, glossy-wet coating indicates that oil is entering the combustion chamber.
2. A spark plug that is wet with gasoline or has sooty deposits indicates either a faulty ignition or a problem with carburetion.

Spark Plug Installation:

Spark plugs must be screwed in correctly to avoid cross-threading, and tightened adequately to ensure proper heat transfer. Do not over-tighten spark plugs.

CAUTION - Threads may strip in the aluminum cylinder heads if over-tightened. Repair will not be covered under warranty.

1. Inspect spark plug threads and clean if necessary.
2. Start screwing spark plugs in by hand. They should screw in easily.
3. Torque spark plugs to 18 to 22 ft-lbs (24 to 30 N-m).

IGNITION TIMING

Timing advances electronically as the engine speed changes.

Ignition Timing Check:

1. With engine not running, connect inductive timing light to front spark plug wire.
2. Loosen timing plug from left side of crankcase where two cylinders meet.

WARNING - Oil mist will exit timing plug hole when engine is running. It is recommended that a transparent inspection plug (not provided) be installed prior to starting engine to prevent discomfort and possible injury to eyes.

3. Start engine and reach normal operating temperature. Using applicable manufacturer's Ignition Installation Instructions, set engine speed to recommended RPM. An inductive tachometer, attached to spark plug cable, may be helpful if the motorcycle is not equipped with a tachometer. Tachometers designed for "wasted spark" ignition systems may read half the actual engine speed.
4. Using dial-back timing light, set the amount of advance specified (28-32° bTDC full advance recommended).
5. Illuminate flywheel inside crankcase through transparent timing plug with timing light. The "T:F" mark stamped on the flywheel should be centered in the plug.
6. Remove transparent timing plug and reinstall metal one supplied with engine.

Ignition Timing Adjustment - **TO BE PERFORMED ONLY BY AN AUTHORIZED SERVICE AGENT** - Use the Ignition Timing Check Procedure, except as follows:

1. Before starting engine, remove ignition sensor access plate from gear cover on right side of engine crankcase after removing two screws.
2. Slightly loosen two screws which hold sensor plate.
3. While engine is running, slightly rotate sensor plate. Clockwise rotation advances timing.
4. When timing is correct, tighten sensor plate screws and recheck timing.
5. Reinstall ignition sensor access plate and install the two screws.

STORAGE

If the motorcycle will be stored for several months, the carburetor float bowl should be drained to avoid a buildup of gum or varnish. The following procedure should be used:

1. Fully close the petcock.
2. Place small, open container below float bowl.
3. Unscrew drain plug to allow gasoline to drain into container.

WARNING - Gasoline is extremely flammable and vapors can be toxic or explosive. Adequate ventilation must be provided and sparks or open flame avoided when working with gasoline.

4. Reinstall and tighten.

88 Cubic Inch Engine Specifications

ENGINE

Number of Cylinders 2
Type ..... 4-Cycle, 45° V
Compression Ratio ..... Normal Altitude: 9.4 to 1[1]
Dry Weight ..... ~ 165 lbs. (75 kg)
Bore ..... 3-5/8 inch (92 mm)
Stroke ..... 4-1/4 inch (108 mm)
Displacement (CI) ..... 88 cubic inch
Displacement (CC) ..... 1,437.6 cc

FUEL SYSTEM

Carburetor...Super E (Butterfly, 1-7/8" (47.6 mm) Bore)
Fuel ..... Unleaded Gasoline: 91 Octane Minimum
Warm Idle Speed ..... 900 +/- 100 RPM

IGNITION SYSTEM

Timing ..... 28° to 32° bTDC Full Advance
Spark Plug Type ..... Champion RN12YC or Equiv.
Size ..... 14 mm, w/Washer
Gap ..... 0.040 to 0.045 inch (1 to 1.1 mm)[1]

VALVE TRAIN

Rocker-Arm Ratio ..... 1.625 to 1
Intake Valve Diameter ..... 2.000 inches (50.8 mm)
Exhaust Valve Diameter ..... 1.605 inches (40.8 mm)
Peak Valve Lift ..... 0.520 inches (13.2 mm)[1]
Intake ..... Open - 0° bTDC[1]
Close - 40° aBDC[1]
Exhaust ..... Open - 50° bBDC[1]
Cloce - 2° aTDC[1]
(Open/Close Timings @ 0.053 inch (1.346mm) Follower Lift)

[1] These specifications may change to optimize engine performance and maintain low emissions.

89 Cubic Inch Engine Specifications

ENGINE

Number of Cylinders 2
Type ..... 4-Cycle, 45° V
Compression Ratio ..... Normal Altitude: 10.1 to 1[1]
Dry Weight ..... ~ 165 lbs. (75 kg)
Bore ..... 3-1/2 inch (88.9 mm)
Stroke ..... 4-5/8 inch (117.5 mm)
Displacement (CI) ..... 88.9 cubic inch
Displacement (CC) ..... 1,458.4 cc

FUEL SYSTEM

Carburetor...Super E (Butterfly, 1-7/8" (47.6 mm) Bore)
Fuel ..... Unleaded Gasoline: 91 Octane Minimum
Warm Idle Speed ..... 900 +/- 100 RPM

IGNITION SYSTEM

Timing ..... 28° to 32° bTDC Full Advance
Spark Plug Type ..... Champion RN12YC or Equiv.
Size ..... 14 mm, w/Washer
Gap ..... 0.040 to 0.045 inch (1 to 1.1 mm)[1]

VALVE TRAIN

Rocker-Arm Ratio ..... 1.625 to 1
Intake Valve Diameter ..... 2.000 inches (50.8 mm)
Exhaust Valve Diameter ..... 1.605 inches (40.8 mm)
Peak Valve Lift ..... 0.520 inches (13.2 mm)[1]
Intake ..... Open - 0° bTDC[1]
Close - 40° aBDC[1]
Exhaust ..... Open - 50° bBDC[1]
Cloce - 2° aTDC[1]
(Open/Close Timings @ 0.053 inch (1.346mm) Follower Lift)

[1] These specifications may change to optimize engine performance and maintain low emissions.

93 Cubic Inch Engine Specifications

ENGINE

Number of Cylinders 2
Type ..... 4-Cycle, 45° V
Compression Ratio ..... Normal Altitude: 9.8 to 1[1]
Dry Weight ..... ~ 165 lbs. (75 kg)
Bore ..... 3-5/8 inch (92 mm)
Stroke ..... 4-1/2 inch (114.3 mm)
Displacement (CI) ..... 92.8 cubic inch
Displacement (CC) ..... 1,522.1 cc

FUEL SYSTEM

Carburetor...Super E (Butterfly, 1-7/8" (47.6 mm) Bore)
Fuel ..... Unleaded Gasoline: 91 Octane Minimum
Warm Idle Speed ..... 900 +/- 100 RPM

IGNITION SYSTEM

Timing ..... 28° to 32° bTDC Full Advance
Spark Plug Type ..... Champion RN12YC or Equiv.
Size ..... 14 mm, w/Washer
Gap ..... 0.040 to 0.045 inch (1 to 1.1 mm)[1]

VALVE TRAIN

Rocker-Arm Ratio ..... 1.625 to 1
Intake Valve Diameter ..... 2.000 inches (50.8 mm)
Exhaust Valve Diameter ..... 1.605 inches (40.8 mm)
Peak Valve Lift ..... 0.520 inches[1] (13.2 mm)[1]
Intake ..... Open - 0° bTDC[1]
Close - 40° aBDC[1]
Exhaust ..... Open - 50° bBDC[1]
Cloce - 2° aTDC[1]
(Open/Close Timings @ 0.053 inch (1.346mm) Follower Lift)

[1] These specifications may change to optimize engine performance and maintain low emissions.

96 Cubic Inch Engine Specifications

ENGINE

Number of Cylinders 2
Type ..... 4-Cycle, 45° V
Compression Ratio ..... Normal Altitude: 10.1 to 1[1]
Dry Weight ..... ~ 165 lbs. (75 kg)
Bore ..... 3-5/8 inch (92 mm)
Stroke ..... 4-5/8 inch(117.5 mm)
Displacement (CI) ..... 95.5 cubic inch
Displacement (CC) ..... 1,564.4 cc

FUEL SYSTEM

Carburetor Super E (Butterfly, 1-7/8" (47.6 mm) Bore)
Fuel ..... Unleaded Gasoline: 91 Octane Minimum
Warm Idle Speed ..... 900 +/- 100 RPM

IGNITION SYSTEM

Timing ..... 28° to 32° bTDC Full Advance
Spark Plug Type ..... Champion RN12YC or Equiv.
Size ..... 14 mm, w/Washer
Gap ..... 0.040 to 0.045 inch (1 to 1.1 mm)[1]

VALVE TRAIN

Rocker-Arm Ratio ..... 1.625 to 1
Intake Valve Diameter ..... 2.000 inches (50.8 mm)
Exhaust Valve Diameter ..... 1.605 inches (40.8 mm)
Peak Valve Lift ..... 0.520 inches[1] (13.2 mm)[1]
Intake ..... Open - 0° bTDC[1]
Close - 40° aBDC[1]
Exhaust ..... Open - 50° bBDC[1]
Cloce - 2° aTDC[1]
(Open/Close Timings @ 0.053 inch (1.346mm) Follower Lift)

[1] These specifications may change to optimize engine performance and maintain low emissions.

100 Cubic Inch Engine Specifications

ENGINE

Number of Cylinders 2
Type ..... 4-Cycle, 45° V
Compression Ratio ..... Normal Altitude: 9.0 to 1[1]
Dry Weight ..... ~ 165 lbs. (75 kg)
Bore ..... 4 inch (101.6 mm)
Stroke ..... 4 inch (101.6 mm)
Displacement (CI) ..... 100.5 cubic inch
Displacement (CC) ..... 1,647.4 cc

FUEL SYSTEM

Carburetor .. Super G (Butterfly, 2-1/16" (52.3 mm) Bore)
Fuel ..... Unleaded Gasoline: 91 Octane Minimum
Warm Idle Speed ..... 900 +/- 100 RPM

IGNITION SYSTEM

Timing ..... 28° to 32° bTDC Full Advance
Spark Plug Type ..... Champion RN12YC or Equiv.
Size ..... 14 mm, w/Washer
Gap ..... 0.040 to 0.045 inch (1 to 1.1 mm)[1]

VALVE TRAIN

Rocker-Arm Ratio ..... 1.625 to 1
Intake Valve Diameter ..... 2.000 inches (50.8 mm)
Exhaust Valve Diameter ..... 1.605 inches (40.8 mm)
Peak Valve Lift ..... 0.520 inches (13.2 mm)[1]
Intake ..... Open - 0° bTDC[1]
Close - 40° aBDC[1]
Exhaust ..... Open - 50° bBDC[1]
Cloce - 2° aTDC[1]
(Open/Close Timings @ 0.053 inch (1.346mm) Follower Lift)

[1] These specifications may change to optimize engine performance and maintain low emissions.

107 Cubic Inch Engine Specifications

ENGINE ..... IGNITION SYSTEM

Number of Cylinders 2
Type ..... 4-Cycle, 45° V
Compression Ratio ..... Normal Altitude: 9.1 to 1[1]
Dry Weight ..... ~ 165 lbs. (75 kg)
Bore ..... 4 inch (101.6 mm)
Stroke ..... 4-1/4 inch (108 mm)
Displacement (cubic inch) ..... 106.8 ci
Displacement (cubic centimeters) ..... 1,750.4 cc

FUEL SYSTEM

Carburetor .. Super G (Butterfly, 2-1/16" (52.3 mm) Bore)
Fuel ..... Unleaded Gasoline: 91 Octane Minimum
Warm Idle Speed ..... 900 +/- 100 RPM

Timing ..... 28° to 32° bTDC Full Advance
Spark Plug Type ..... Champion RN12YC or Equiv.
Size ..... 14 mm, w/Washer
Gap ..... 0.040 to 0.045 inch (1 to 1.1 mm)[1]

VALVE TRAIN

Rocker-Arm Ratio ..... 1.625 to 1
Intake Valve Diameter ..... 2.000 inches (50.8 mm)
Exhaust Valve Diameter ..... 1.605 inches (40.8 mm)
Peak Valve Lift ..... 0.520 inches (13.2 mm)[1]
Intake ..... Open - 0° bTDC[1]
Close - 40° aBDC[1]
Exhaust ..... Open - 50° bBDC[1]
Cloce - 2° aTDC[1]
(Open/Close Timings @ 0.053 inch (1.346mm) Follower Lift)

[1] These specifications may change to optimize engine performance and maintain low emissions.

113 Cubic Inch Engine Specifications

ENGINE

Number of Cylinders 2
Type ..... 4-Cycle, 45° V
Compression Ratio ..... Normal Altitude: 9.0 to 1[1]
Dry Weight ..... ~ 165 lbs. (75 kg)
Bore ..... 4 inch (101.6 mm)
Stroke ..... 4-1/2 inch (114.3 mm)
Displacement (cubic inch) ..... 113.1 ci
Displacement (cubic centimeters) ..... 1,853.3 cc

FUEL SYSTEM

Carburetor .. Super G (Butterfly, 2-1/16" (52.3 mm) Bore)
Fuel ..... Unleaded Gasoline: 91 Octane Minimum
Warm Idle Speed ..... 900 +/- 100 RPM

IGNITION SYSTEM

Timing ..... 28° to 32° bTDC Full Advance
Spark Plug Type ..... Champion RN12YC or Equiv.
Size ..... 14 mm, w/Washer
Gap ..... 0.040 to 0.045 inch (1 to 1.1 mm)[11]

VALVE TRAIN

Rocker-Arm Ratio ..... 1.625 to 1
Intake Valve Diameter ..... 2.000 inches (50.8 mm)
Exhaust Valve Diameter ..... 1.605 inches (40.8 mm)
Peak Valve Lift ..... 0.520 inches (13.2 mm)[1]
Intake ..... Open - 0° bTDC[1]
Close - 40° aBDC[1]
Exhaust ..... Open - 50° bBDC[1]
Cloce - 2° aTDC[1]
(Open/Close Timings @ 0.053 inch (1.346mm) Follower Lift)

[1] These specifications may change to optimize engine performance and maintain low emissions.

Sample